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SCHOOL OF MEDICINE

SHOCK, TRAUMA AND ANESTHESIOLOGY
RESEARCH CENTER

THE CHARLES "MCC" MATHIAS, JR.
NATIONAL STUDY CENTER FOR TRAUMA AND EMS

Maryland Older Drivers

Psychosocial Factors and Injury Outcomes
of Motor Vehicle Occupants Over Age 65

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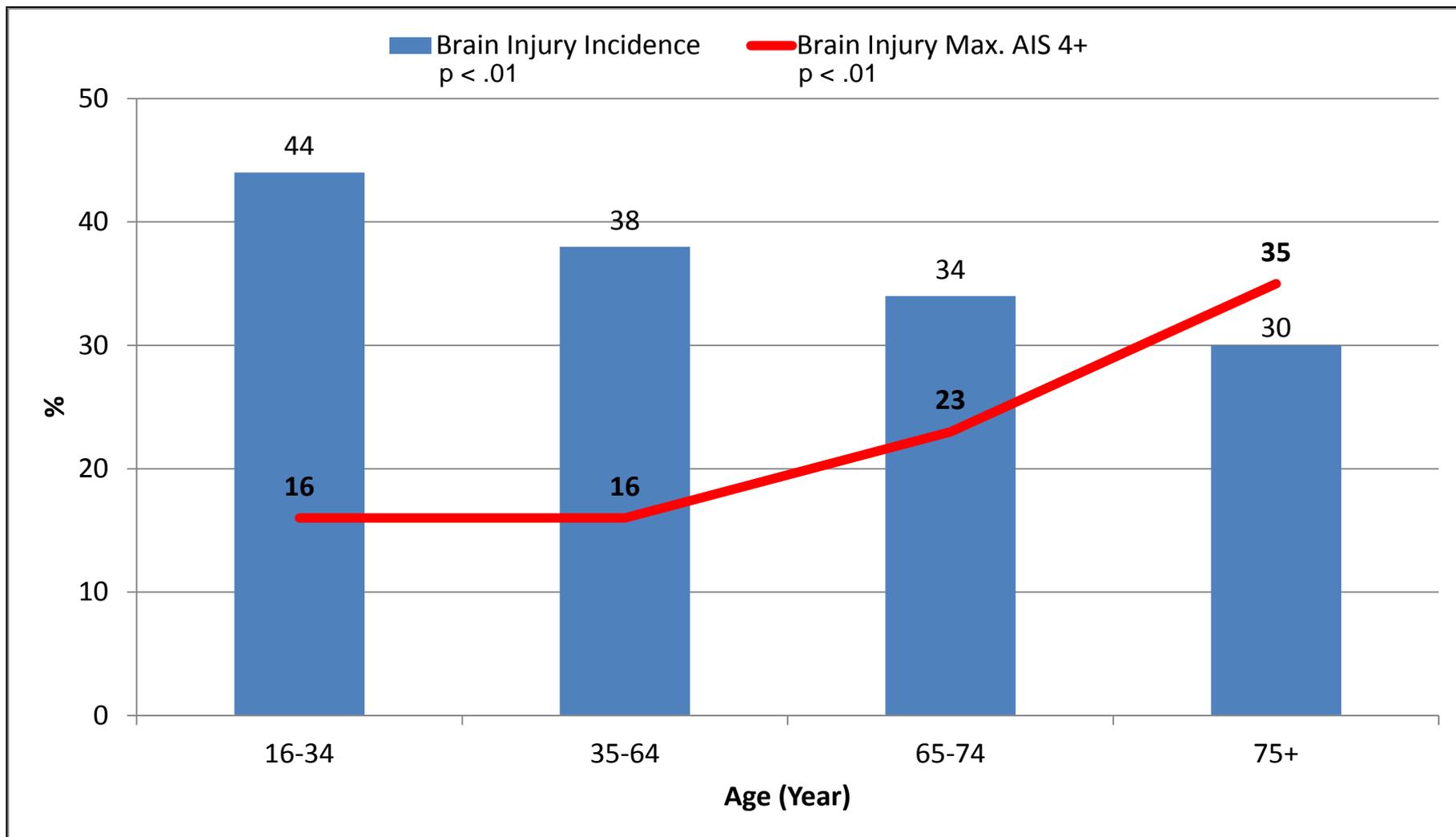
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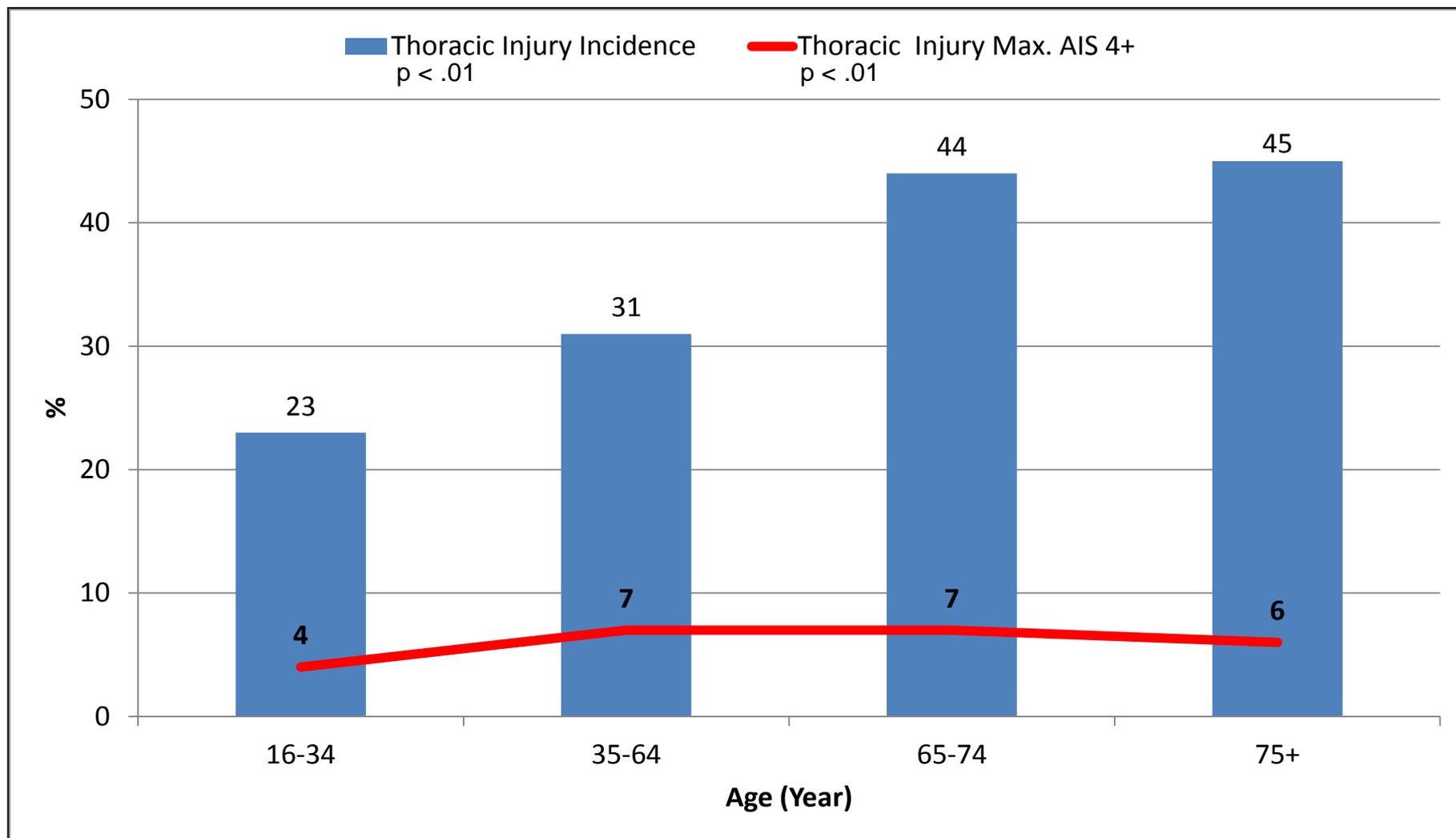
Overview

- Review incidence, severity and type of injuries of older and younger MVC occupants
- Discuss pre-injury occupant and crash characteristics
- Post-trauma outcomes and psychosocial consequences of injury

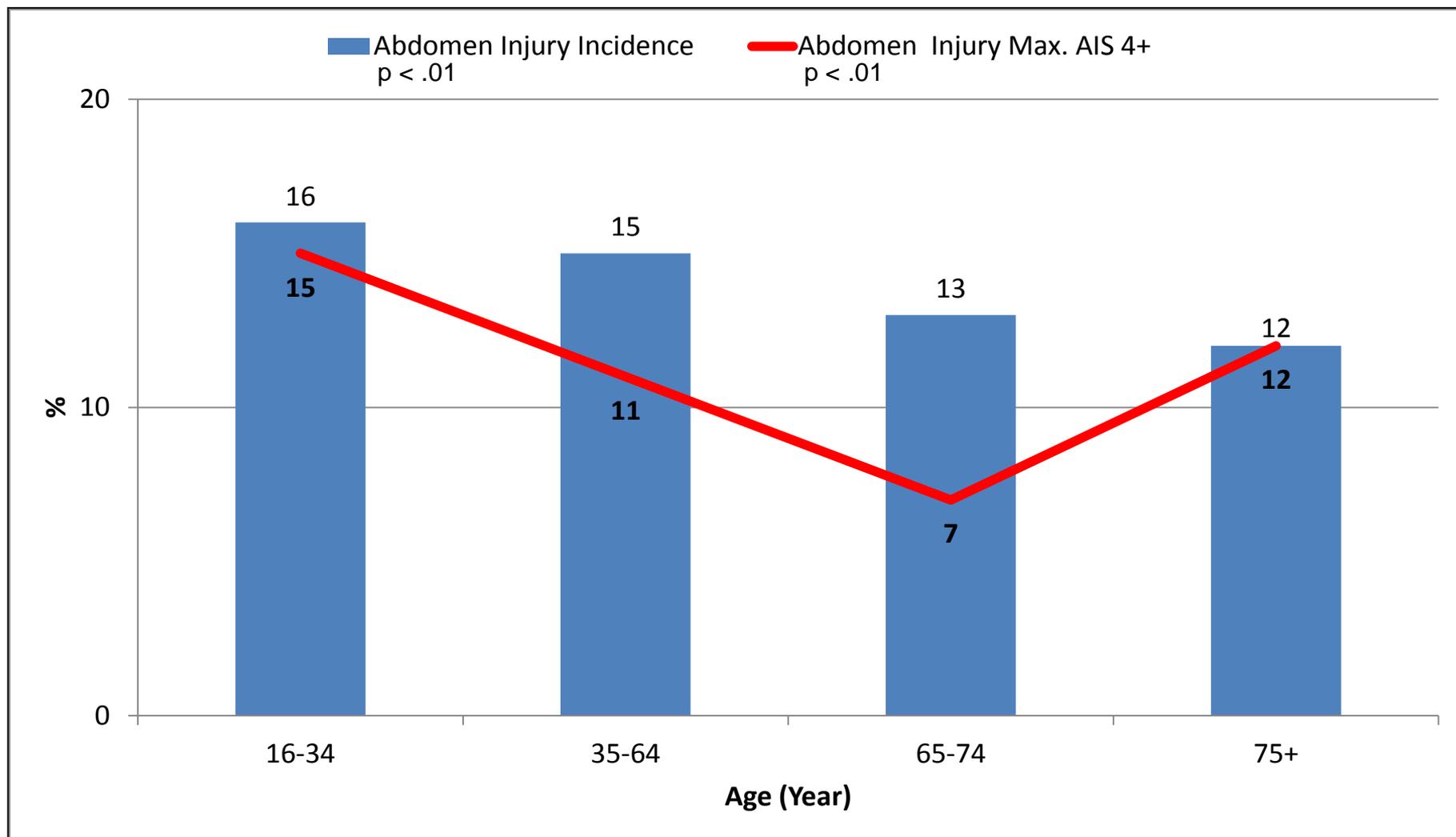
Incidence and Severity of Brain Injury By Age



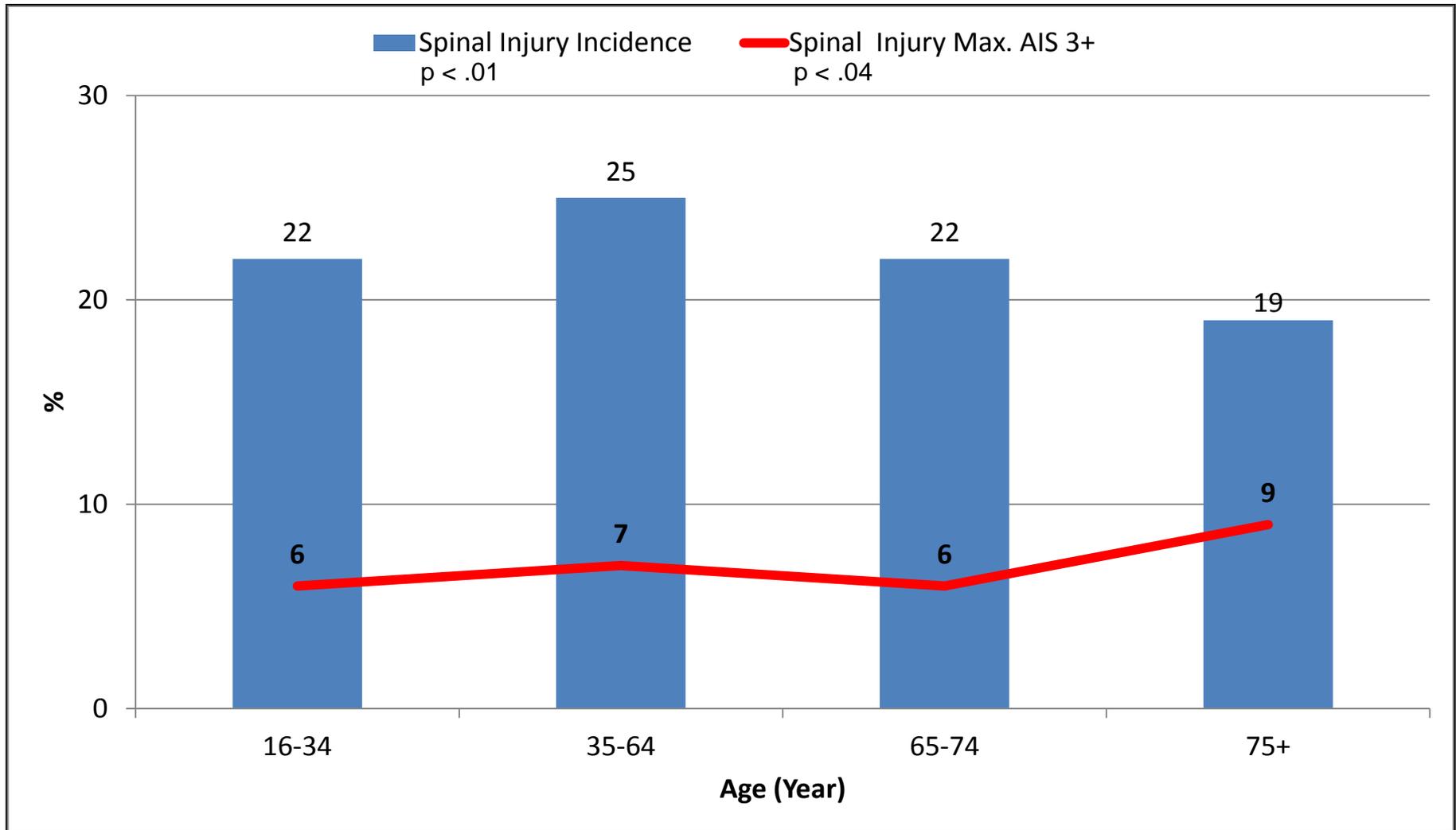
Incidence and Severity of Thoracic Injury By Age



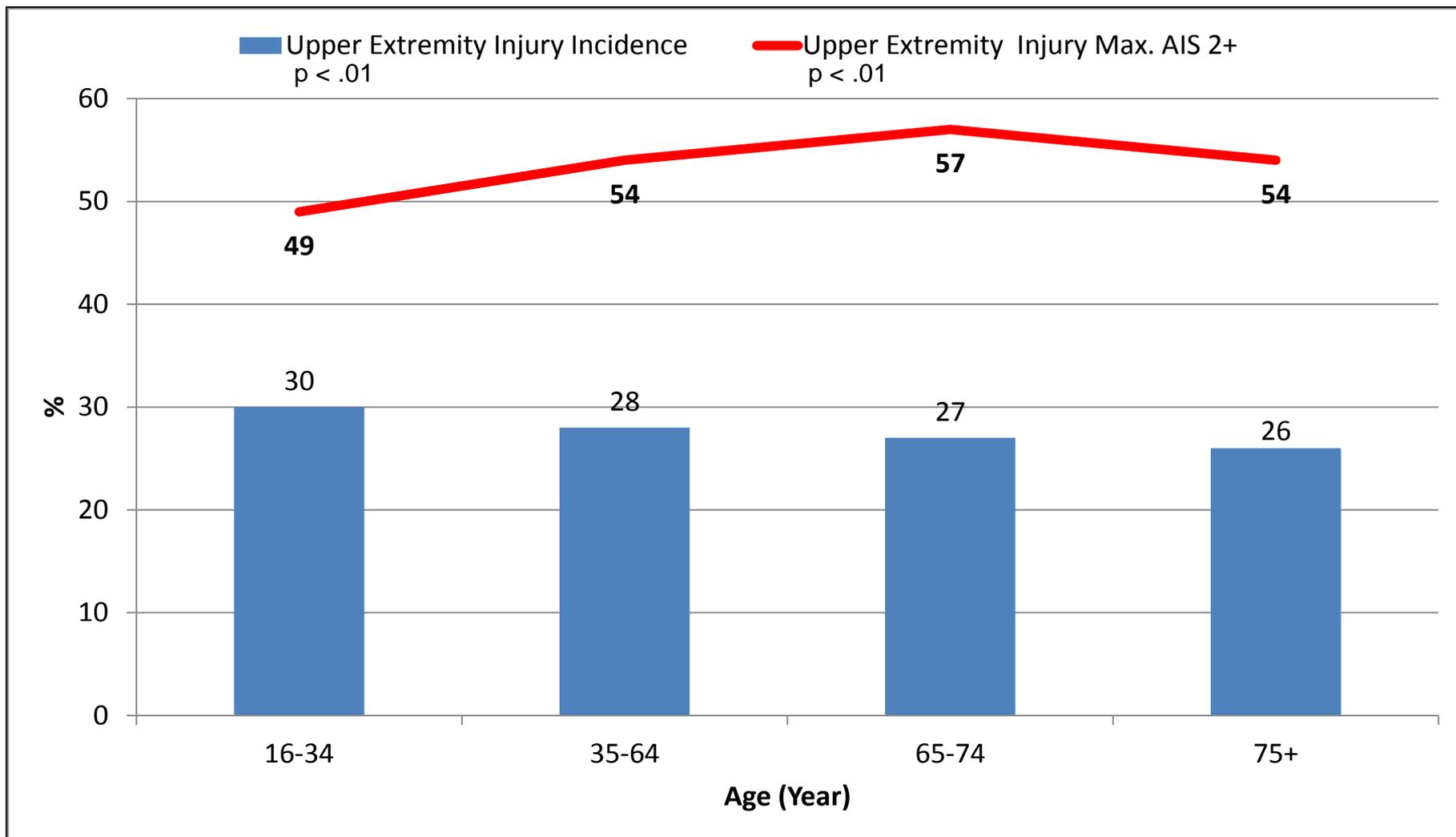
Incidence and Severity of Abdomen Injury By Age



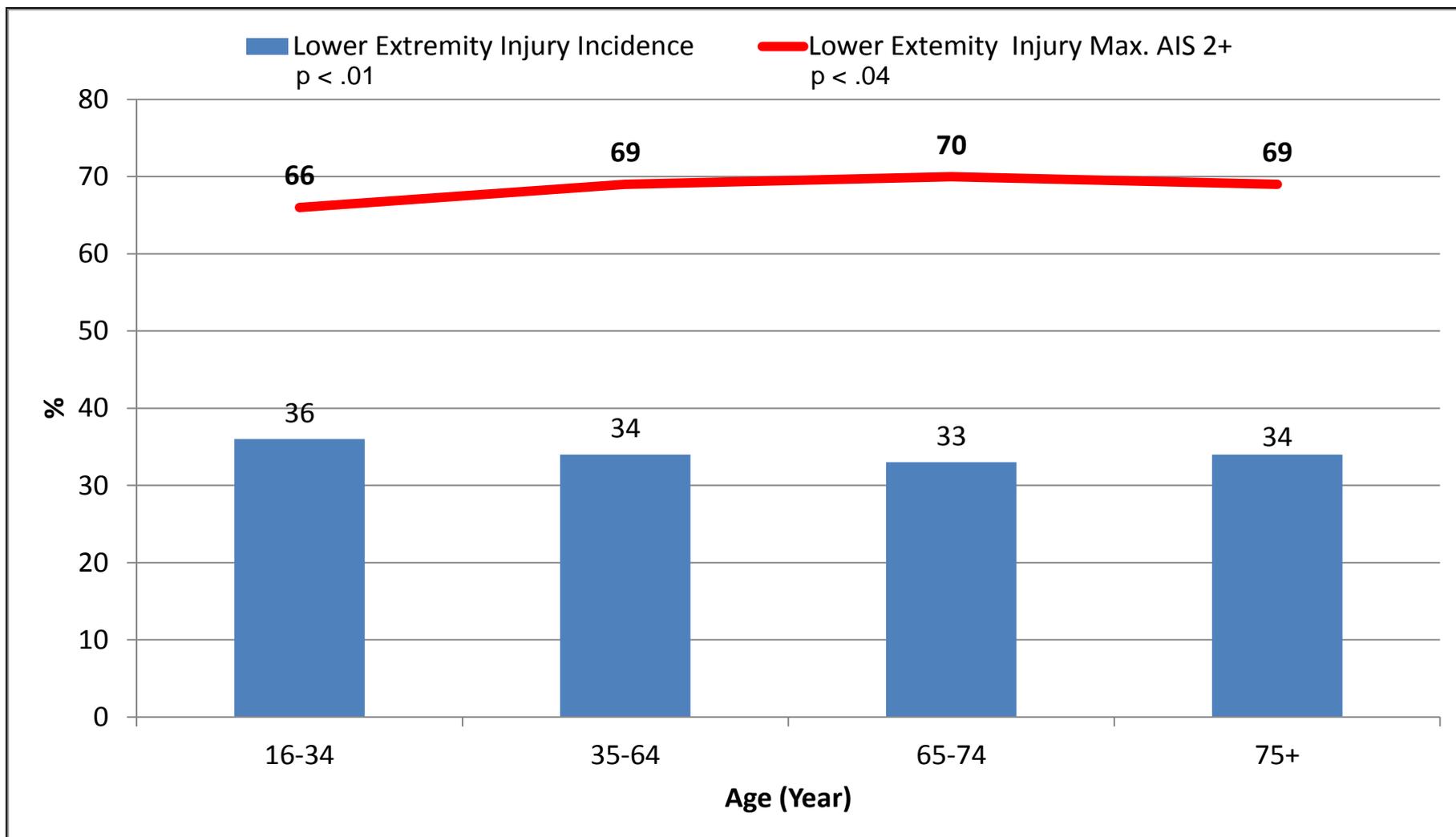
Incidence and Severity of Spinal Injury By Age



Incidence and Severity of Upper Extremity Injury By Age



Incidence and Severity of Lower Extremity Injury By Age



Risk Factors Associated with Pelvic Fractures Sustained in Motor Vehicle Collisions Involving Newer Vehicles

Deborah M. Stein, MD, MPH, James V. O'Connor, MD, MS, Joseph A. Kufera, MA, Shiu M. Ho, MS, Patricia C. Dischinger, PhD, Carol E. Copeland, MD, and Thomas M. Scalea, MD

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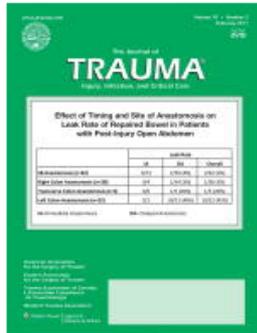
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Occupant and Crash Characteristics for Case Occupants With Cervical Spine Injuries Sustained in Motor Vehicle Collisions

Stein, Deborah M. MD, MPH; Kufera, Joseph A. MA; Ho, Shiu M. MS; Ryb, Gabriel E. MD, MPH; Dischinger, Patricia C. PhD; O'Connor, James V. MD, MS; Scalea, Thomas M. MD



**Association for the Advancement
of Automotive Medicine**

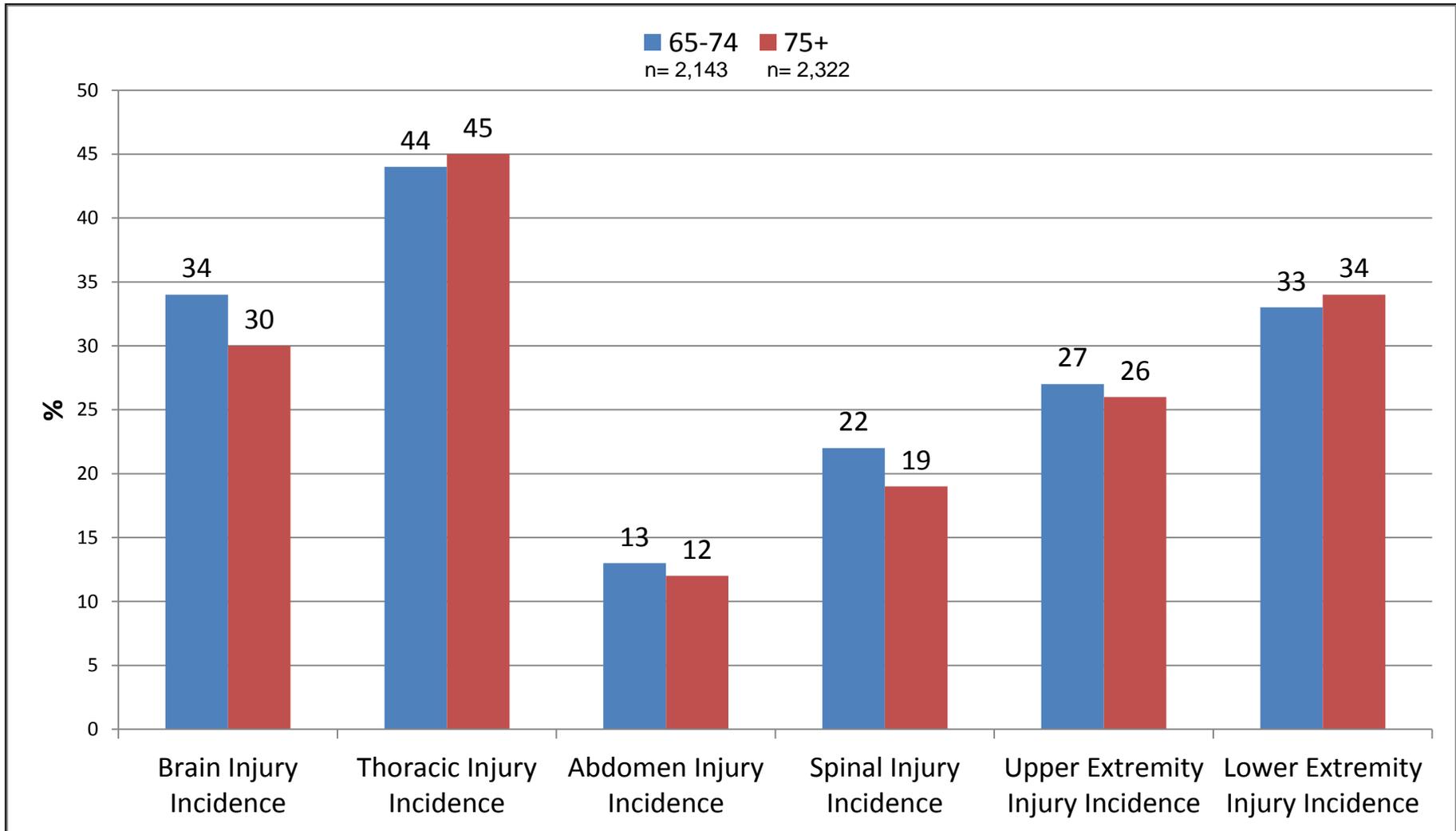
Ann Adv Automot Med. 2008; 52: 227-234.

PMCID: PMC3256764

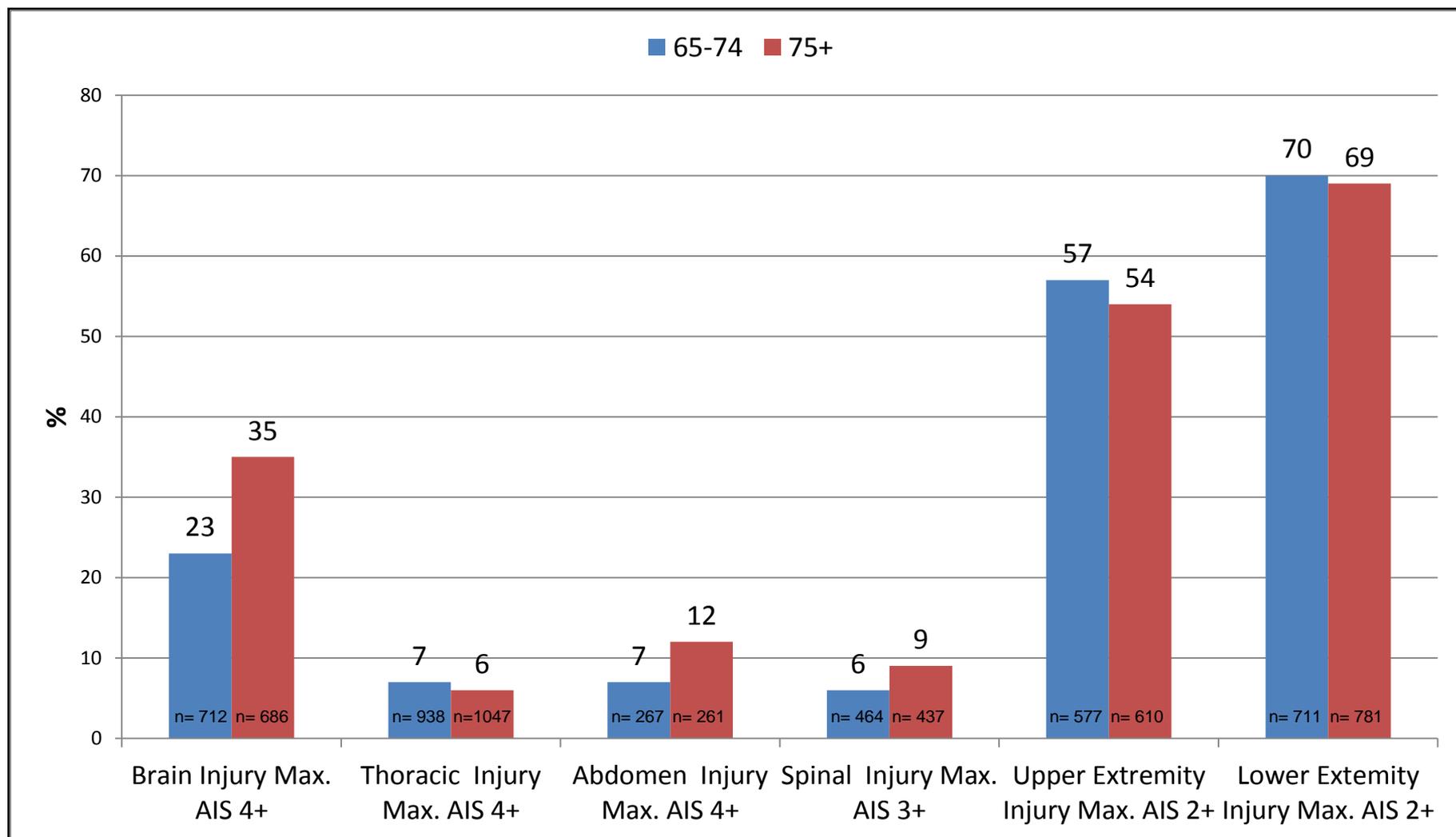
Aging is Not a Risk Factor for Femoral and Tibial Fractures in Motor Vehicle Crashes

[Gabriel Ryb](#), MD, MPH,^a [Patricia Dischinger](#), PhD,^a [Michael Kleinberger](#), PhD,^b [Cynthia Burch](#), MPH,^a and [Shiu Ho](#), MS^a

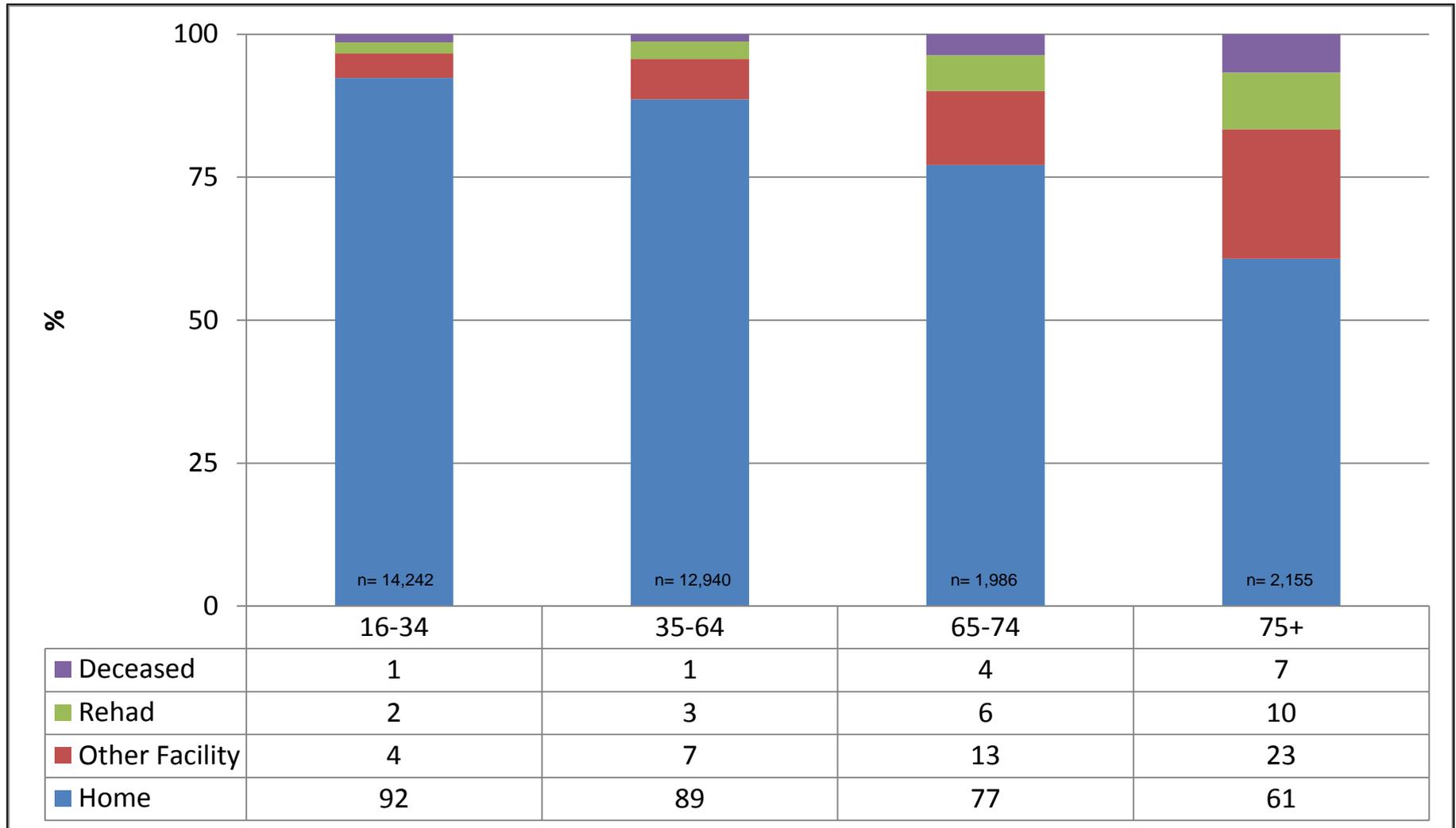
Incidence of Injury By Age



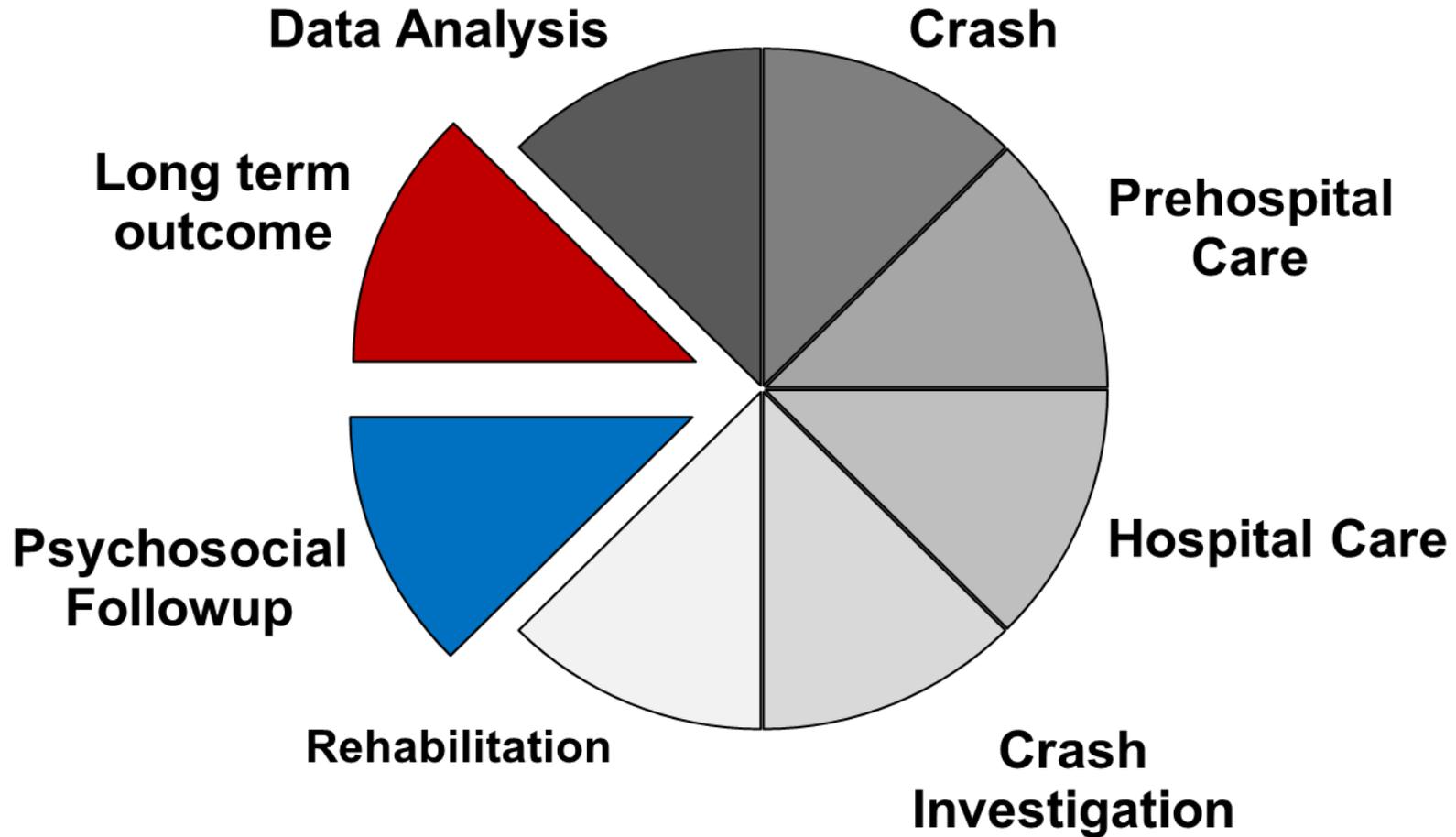
Incidence of Severe Injury By Age



Hospital Discharge Status By Age



Multidimensional Model



Psychosocial Dimensions of Vehicular Injury

- Employment/Occupation/Education
- Pre-Injury History/Trauma
- Payor Sources, costs, impact
- Co-morbidity
- Physical/Cognitive/Emotional Outcomes
- Litigation
- Role of Alcohol and Drugs

Standardized Measurements Psychosocial Outcomes

1. SF 36 - Short Form Health Survey (MOS)
2. CAGE - Alcohol and Drugs
3. AUDIT - Alcohol
4. NRS - Numerical Rating Scale for Pain
5. Depression Screening
6. Cognitive Functioning
7. PTSD - Post Traumatic Stress Disorder

**Physical
Component**

SF-36

**Mental
Component**

Physical Function

Mental Health

Role Physical

Role Emotional

Bodily Pain

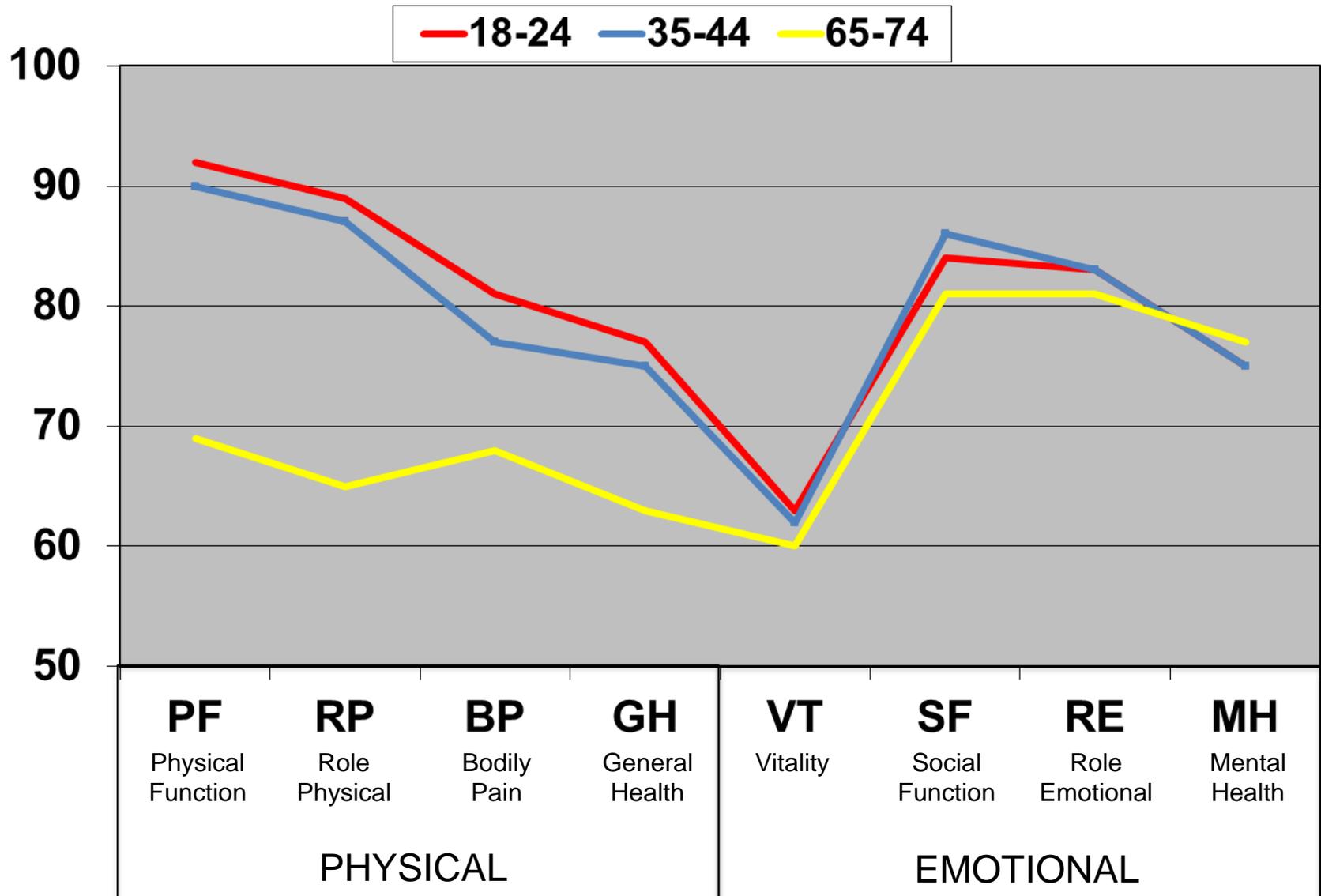
Social Function

General Health

Vitality



SF36 Norms by Age Group



Patient Characteristics

	Under 65 (n=480)	Over 65 (n=82)
Marital Status:		
Married	50%	63%
Divorced/Separated	12	4
Widowed	3	30
Gender (Female)	55	62
Average Age (42)	36	74
Smoker	35	7
Household Income < \$50,000	38	19

Occupant / Crash Characteristics

	Under 65 (n=480)	Over 65 (n=82)
Driver	84%	72%
Culpability	61	70
Restraint Use:		
Seat Belt & Air Bag	63	70
Air Bag Only	18	10
Seat Belt Only	13	9
Additional Family Member Injured/Killed in Crash	19	43

Occupant / Crash Characteristics

	Under 65 (n=480)	Over 65 (n=82)
GCS 15	80%	79%
LOC / Altered Mental Status Medical Record/Pt. Reported	32/49	34/55
GCS 13-14	10	13
GCS <12	11	7

Occupant / Crash Characteristics

	Under 65 (n=480)	Over 65 (n=82)
Substance-Related Crash	29%	4%
Alcohol on Admission (BAC)	18	0
Cage 2+	22	5

Pre-injury Characteristics

	Under 65 (n=480)	Over 65 (n=82)
Co-morbidity	53%	95%
Hypertension	17	70
Diabetes	6	24
Heart	4	28
Cancer	3	29
Co-morbidity – 2 or more	24	83
Co-morbidity – 3 or more	10	43
Depression history	31	21
Depression current	28	22

Pre-injury Characteristics

	Under 65 (n=480)	Over 65 (n=82)
HX of prior injury		
MVC	31%	23%
Assault	10	1
Prior Trauma History	23	10
Moving Violations	36	13
History of DWI/DUI	14	4
Stressful life crisis within 6mo of crash	47	33

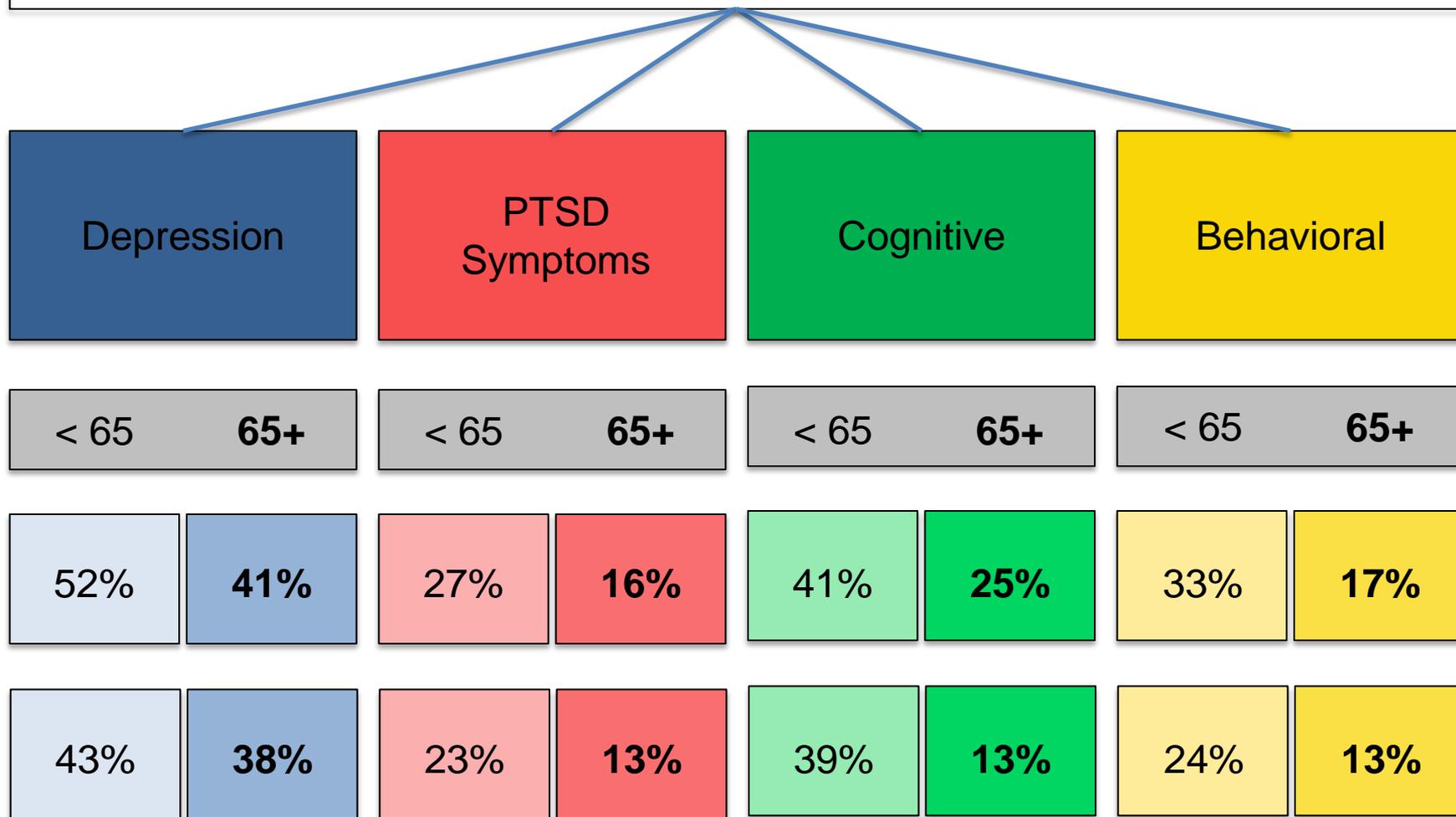
Median Costs

	Under 65 (n=480)	Over 65 (n=82)
Hospital	49,504	41,469
Professional	11,569	12,078
Rehab	21,000	25,390
Total	87,142	93,780

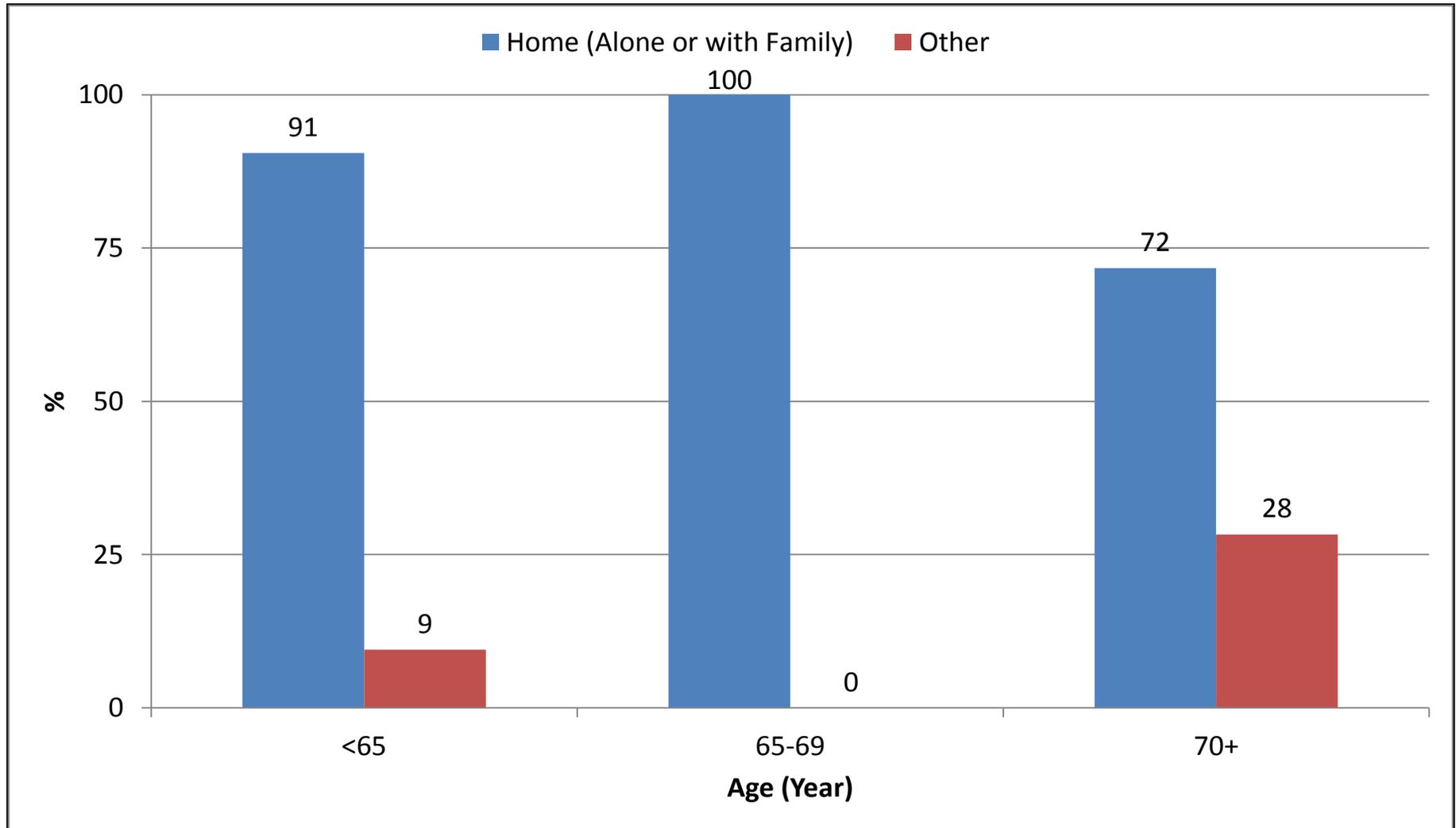
Post Trauma Outcomes

	Under 65		Over 65	
	<u>6 mo.</u>	<u>1 yr.</u>	<u>6 mo.</u>	<u>1 yr.</u>
Return to driving	68%	81%	57%	70%
Legal/Litigation	59	38	42	18
Disrupting Pain	48	47	35	52
Spirituality/Recovery	51	52	77	75
Severe Financial Impact	28	26	10	9

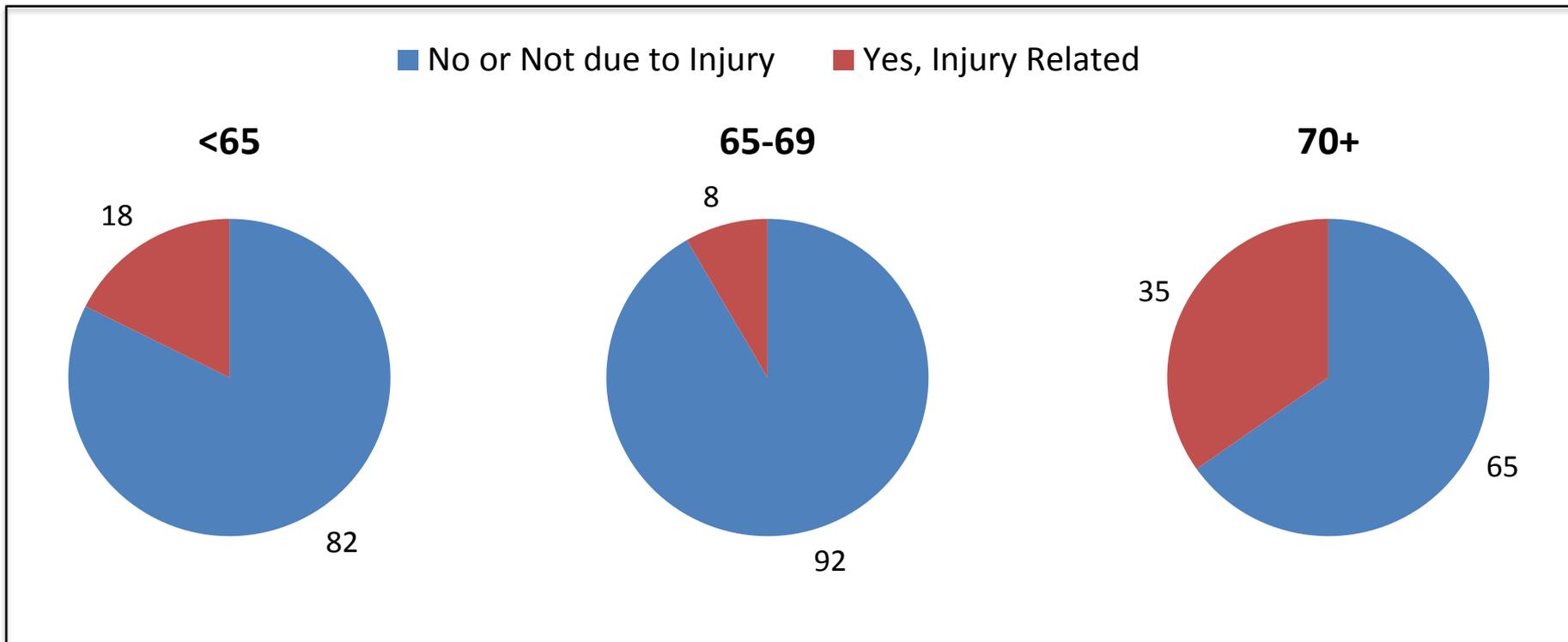
Psychological Post Trauma Outcomes



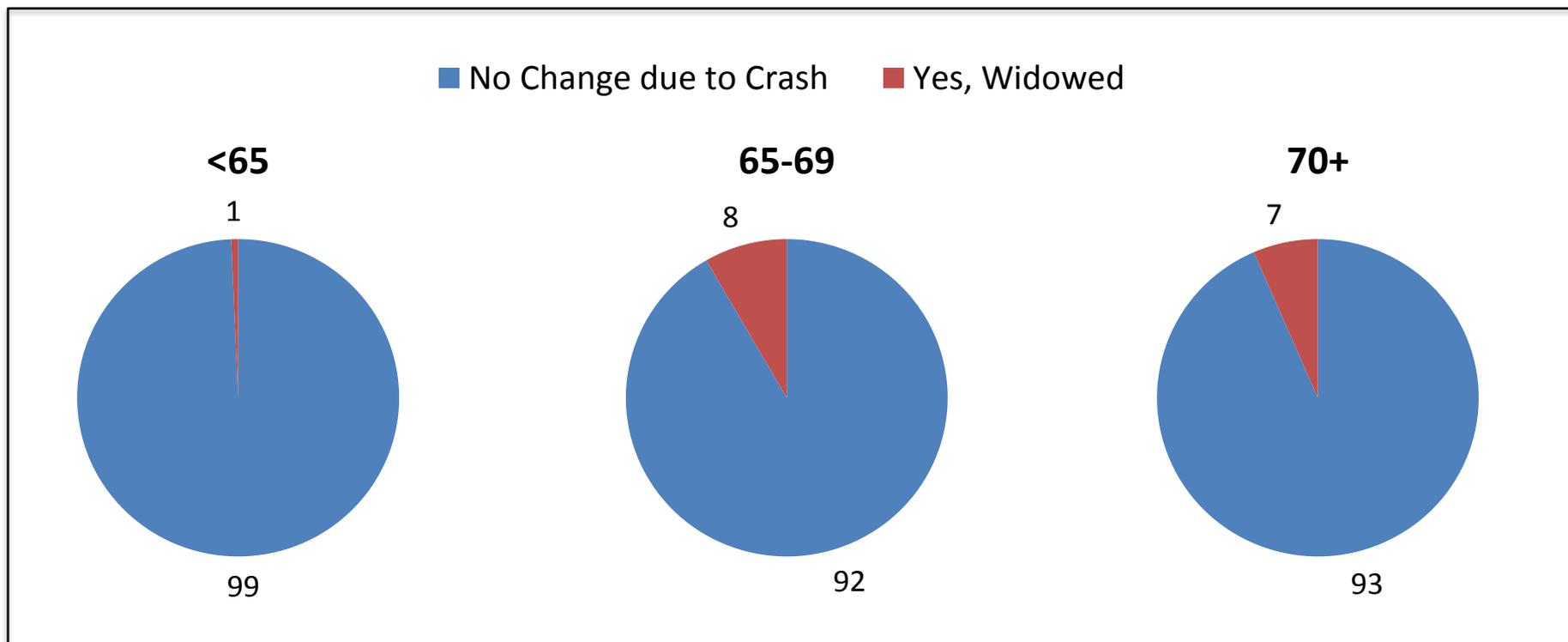
Living Situation 6 Months Post Crash By Age



Change in Living Situation 6 Months Post Crash By Age

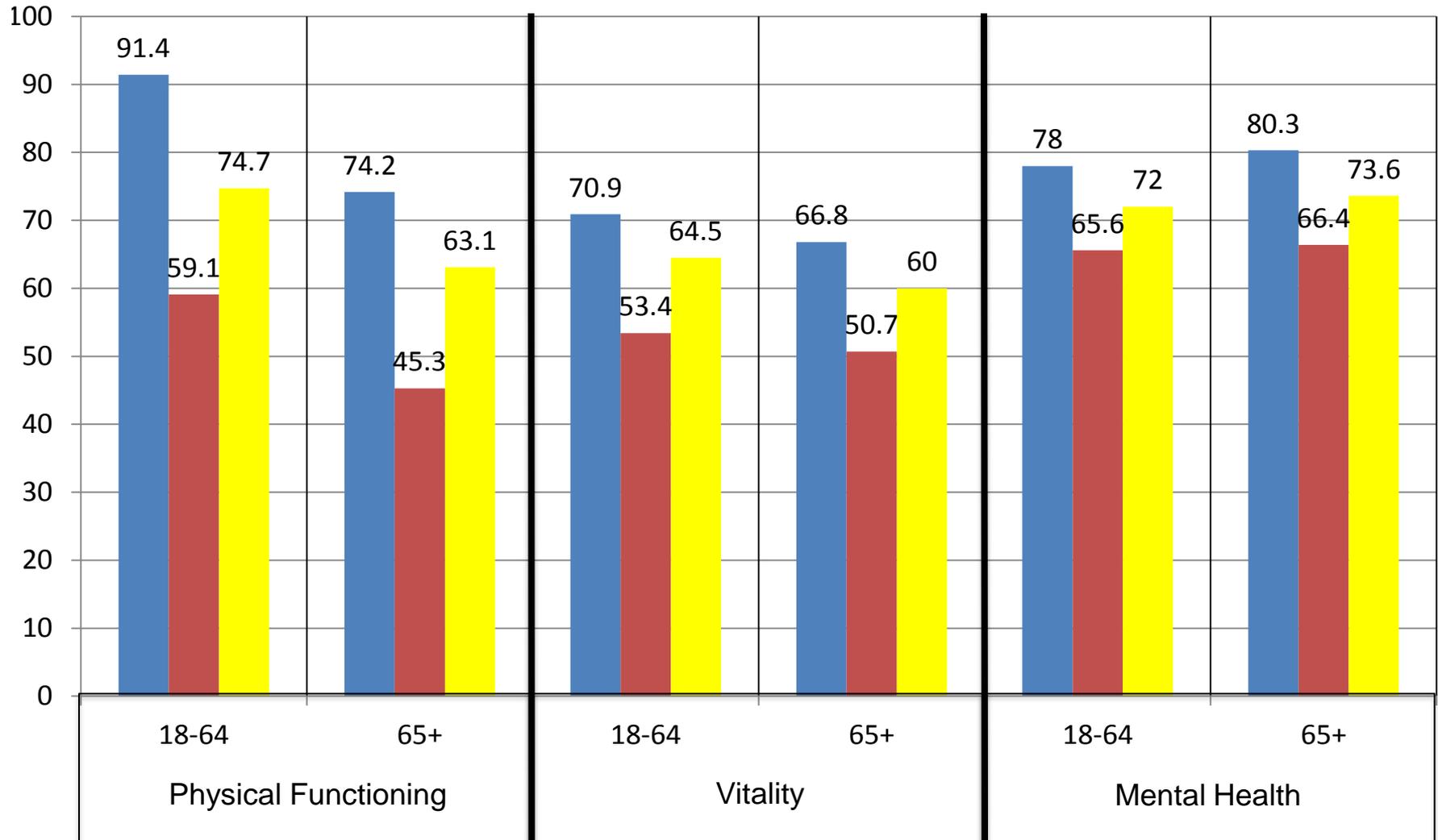


Change in Marital Status 6 Months Post Crash By Age

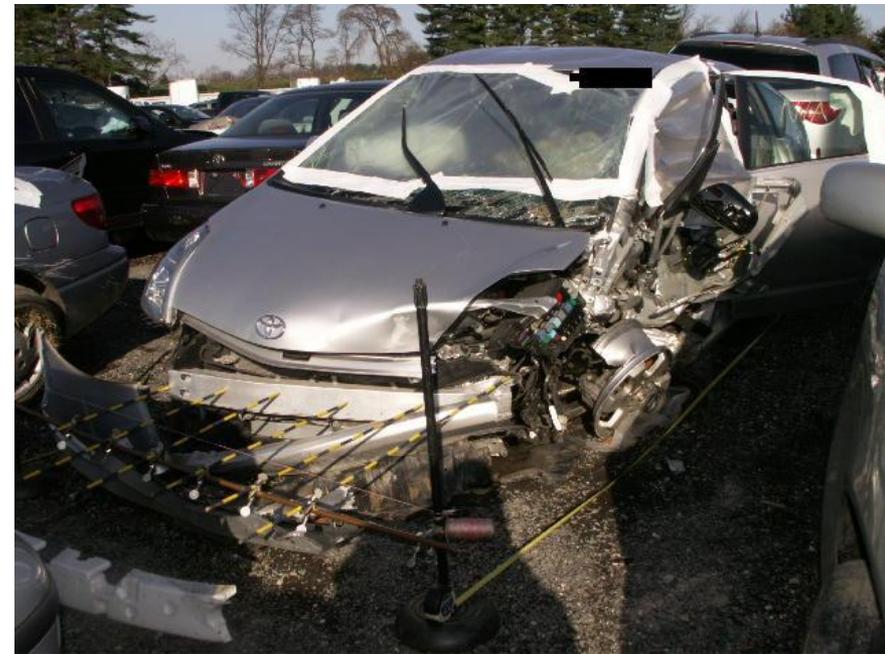


SF-36 Outcome Measures Stratified by Age

■ Baseline ■ 6 Months ■ 12 Months



- Case vehicle: 2006 Toyota Prius
- General crash type: Frontal
- V2 / Object struck: Guardrail end
- Seat Position: Driver
- Gender / Age: Male / 87
- Ht./ Wt./ BMI: 5'10" / 140lbs. / 20.1
- Restraint Use: 3-point Lap & Shoulder
- Air Bag Deployment: Frontal Air Bag deployed

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L

Pre-Injury

- 87 year old married male
- Returning home from lunch outing
- Independent in activities of daily living with no major medical comorbidities, but mild dementia noted
- Slow unstable gait with recent falls and 3 non-injury crashes in recent months

At Discharge

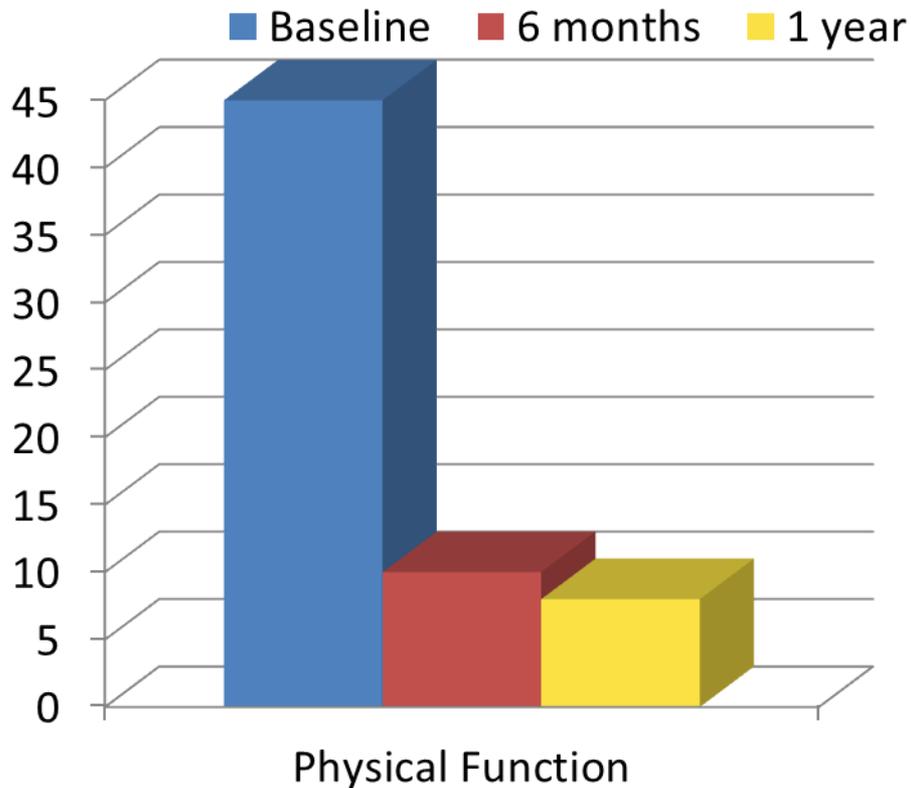
- Length of stay - 6 days
- Non-weight bearing on the left lower extremity
- Weight bearing as tolerated on the right lower extremity
- Discharged to in-patient rehab and remained there for 2 months, then home with full-time aid

Post-Trauma

- Injury necessitated relocation into an assisted living facility with full health and social services
- Patient ambulates with walker
- Further decline in cognitive functioning
- Struggling to adjust to new living environment
- Costs:
 - Hospital & Professional: \$25,152
 - Re-habilitation: approx. \$26,000
 - Home Care: \$9,000

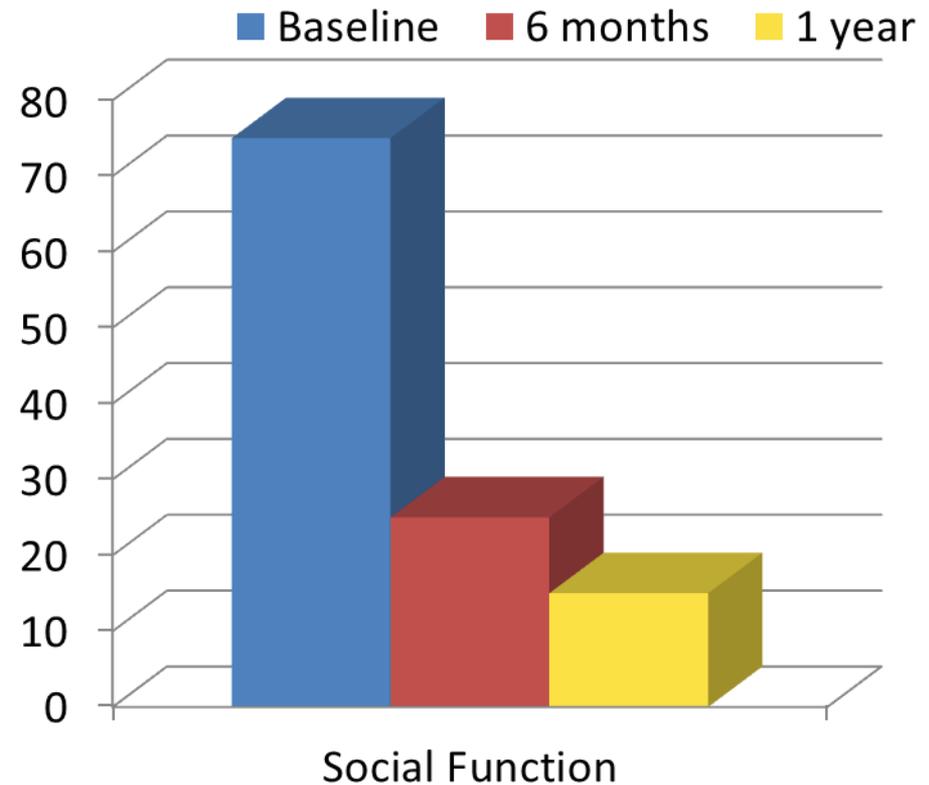
PHYSICAL FUNCTIONING (PF)

- Measures any limitations in physical activities from bathing and dressing to the most rigorous activity.



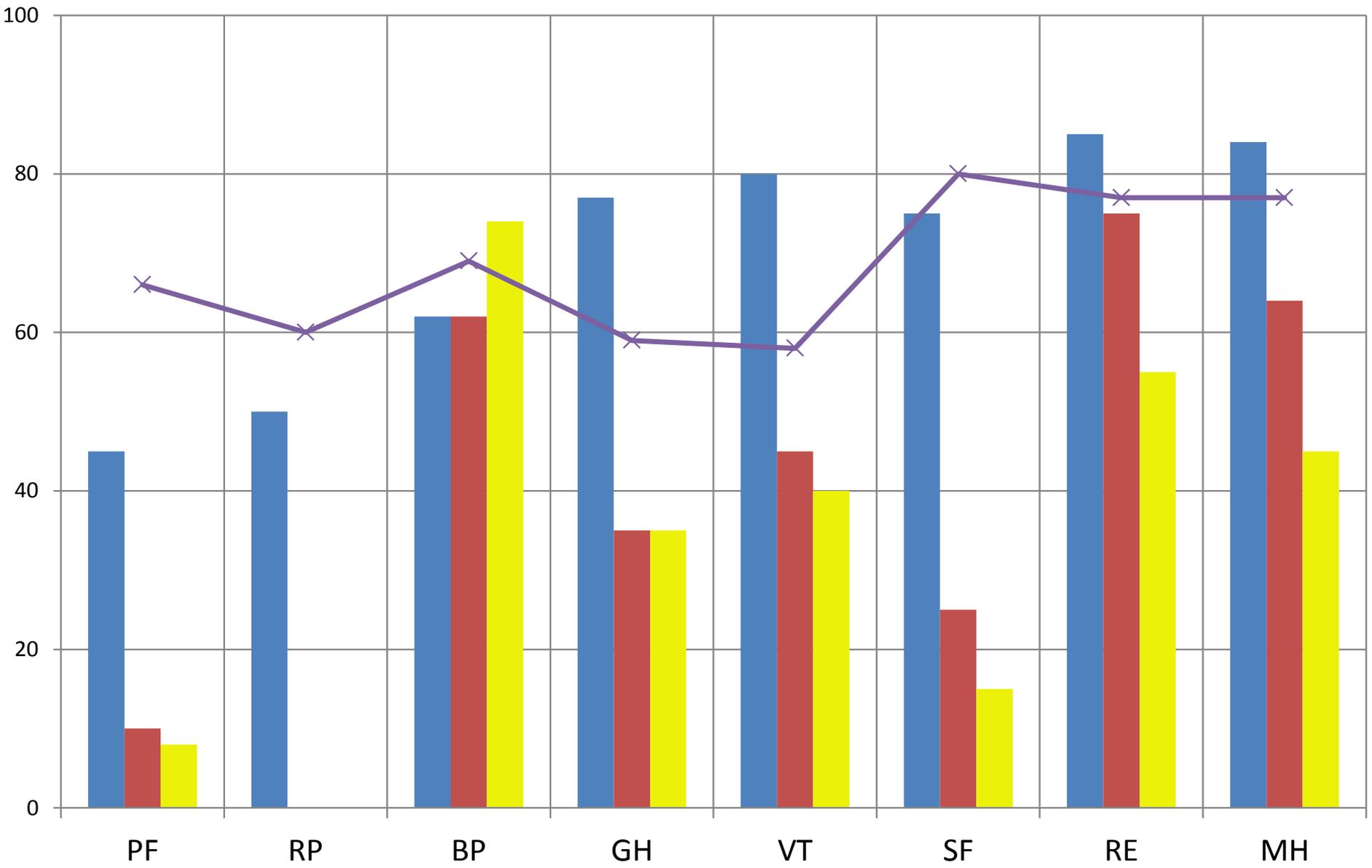
SOCIAL FUNCTIONING (SF)

- Extent physical or emotional health interferes with social activity



Maryland Older Divers- Psychosocial Factors and Injury Outcomes of Motor Vehicle Occupants 65+

Pre-Injury 6 Months Post Crash 12 Months Post Crash Norm



Summary

- Older drivers...
 - Are less likely to be discharged home
 - Are more likely to have a change in living situation
 - Are more likely to require rehab services
- Older patients require rehab focusing on physical domains while younger patients may require more mental/emotional support
- Age itself is not a significant predictor of the potential for recovery especially when other age associated conditions are considered.
- Pre-injury functional status has a major influence on recovery following vehicular trauma

